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ABSTRACT

The handbook presents California guidelines for training school personnel to provide skilled nursing procedures such as tracheostomy suctioning and misting for students with special health needs. The workbook begins with an overview of the anatomy and function of the respiratory system, specifically breathing mechanics. Part 2 considers the rationale and performance of tracheostomy suctioning using a sleeved catheter. Essential steps and precautions are outlined from student and equipment preparation through actual suctioning and recordkeeping. Illustrations depict the procedures. The final part describes the purposes and procedures for using the mist machine which is necessary to counteract low humidity and/or dry lung linings. Each of the sections include post-tests to test knowledge on the procedures. (CL) .

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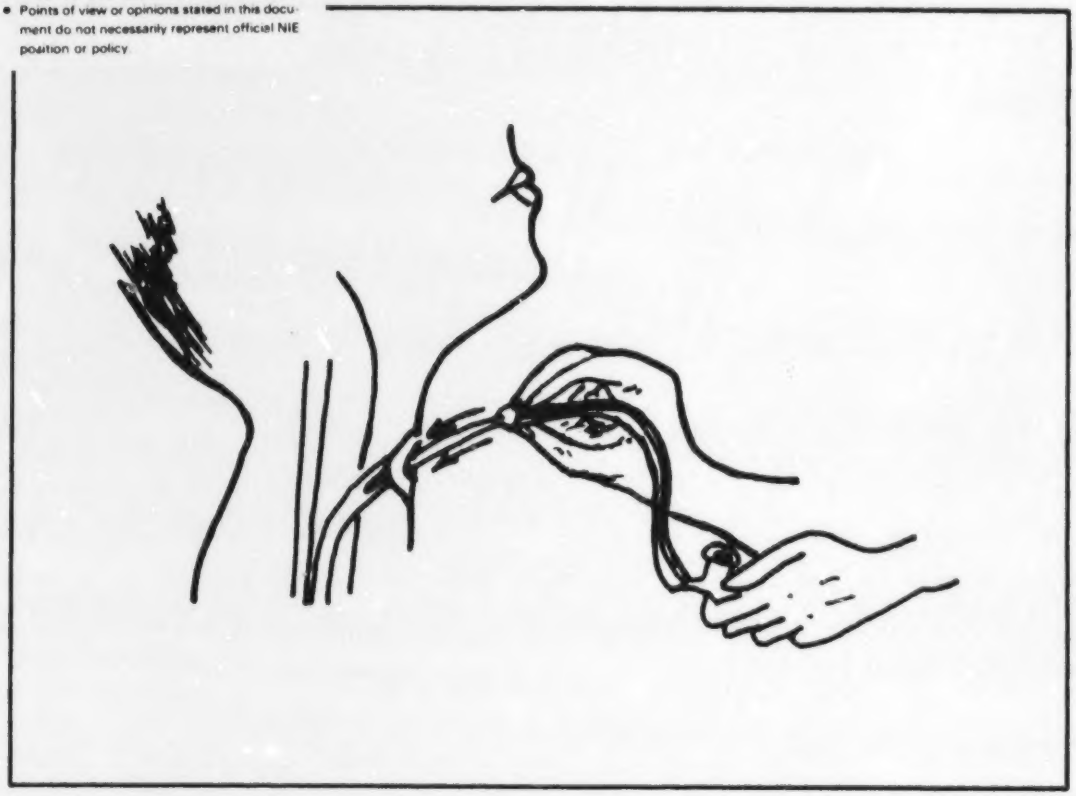

INSTRUCTION WORKBOOK FOR TRACHEOSTOMY SUCTIONING AND MISTING IN A SCHOOL SETTING

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INSTRUCTION WORKBOOK FOR TRACHEOSTOMY SUCTIONING AND MISTING IN A SCHOOL SETTING

by

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and

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March, 1985

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EC 180501

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Foreword

In 1975, President Ford signed Public Law 94-142 which states that all school children must be provided an educational program in the least restrictive environment. Consequently, *high risk* children such as tracheostomy students are now served in special education programs and/or integrated classrooms in community settings. In order to provide an optimal safe and healthy environment for this ***high risk*** child, ***Guidelines And Procedures For Meeting The Specialized Physical Health Care Needs Of Students*** was adopted by the State of California Department of Education in 1982. The Guidelines state that qualified personnel may be trained by a school nurse to provide skilled nursing procedures such as tracheostomy suctioning. In accordance with State guidelines, this workbook has been created to provide:

- Written instructions for qualified designated personnel;
- An instructional resource for the school nurse to teach qualified designated personnel.

SUGGESTED GUIDELINES

Personnel Recommendation:

According to State Guidelines, *The procedure for tracheostomy suctioning should be performed by the qualified school nurse, physician and surgeon, or by qualified designated school personnel under supervision, as recommended by the qualified professional nurse and agreed upon by the individualized education program team.*[1]

Special Note:

Some students needing tracheostomy care have the potential of presenting a life-threatening respiratory emergency. Therefore, it was felt by the state-wide subcommittee that a qualified professional nurse or physician should be privileged to exercise judgment and recommend the level of supervision required to the individualized education program team. The individualized education program team should honor the health professional's recommendation in these cases. Students with tracheostomies of long standing; i.e., three months and older, may not require the presence of qualified nurse on site at all times. The nurse, with the informed consent of the parent, should advise the individualized education program team, based on her professional judgment, regarding the supervision necessary for the individual child.[2]

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[1] From *Guidelines and Procedures for Meeting the Specialized Physical Health Care Needs of Students* (State of California, Department of Education, 3/1982), p. 42.

[2] Ibid., p. 35.

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HOW TO USE THIS WORKBOOK

1. Complete the Pretest.

2. Check your answers with the answer sheet provided by the School Nurse.
   - Mastery of this module is indicated by 100% of the questions being answered correctly.
   - If your score is less than 100%, you are to complete the activities in this workbook.

3. Some pages of this workbook have questions on them. When you come to a question, write your answer in the blank space provided on the same page. Then check your answer with the correct answer appearing on the following page. If your answer is incorrect, check back to see where you made your error.

4. Read the introduction of this workbook, and then proceed to Part I.

5. Make sure you complete Part I before beginning Part II, and Part II before proceeding to Part III.

6. After completion of all three sections of this workbook, take the Post Test. Mastery is accomplished when 100% of items are answered correctly.

7. When finished, turn in the Post Test to the School Nurse. The School Nurse will hold a conference with you to discuss the parts of the workbook for which you may need clarification, and will supervise a return demonstration of the suctioning and misting procedures.

TRACHEOSTOMY SUCTIONING AND MISTING PRETEST

1. Suctioning shall be performed
   a. When _____
   b. When _____
   c. When _____
   d. According to M.D.'s special orders
   e. Upon request of the child
2. Equipment needed for the procedure includes:
   a. Suction machine
   b. _____
   c. Container of sterile fluid
3. The basic steps included in the tracheostomy suctioning procedure are:
   a. Open and attach _____ to suction machine tubing.
   b. Turn machine on.
   c. Push _____ sleeve away from catheter (about 6 inches).
   d. Test suction by inserting tube into sterile _____ and observe the flow of sterile _____ through the catheter and tubing.
   e. Insert the catheter _____ without closing the control valve.
   f. Rotate the catheter and withdraw quickly with control valve _____. Do not suction more than 10 seconds.
   g. Rinse tube as necessary.
   h. Observe student closely after the procedure for improved color and _____.
   i. Repeat the procedure as many as _____ times. If color and respiration do not improve, seek other assistive care.
   j. Rinse tubing and drainage bottle in clear water, then wash in warm detergent water and rinse in vinegar solution made up of _____ part boiled water and _____ part white vinegar.
4. The three parts of the throat are:
   a. _____
   b. _____
   c. _____
5. Misting should be applied:
   a. At _____ time set by physician or nurse.
   b. When breathing is _____ and _____ indicating dry lungs.
   c. Frequently when _____ humidity exists and during very _____ weather.

(continued on reverse)

6. Sterile _____ or 0.9N _____ solution is used for misting.
7. Mist student for at least _____minutes.
8. Encourage _____ to loosen and bring up any mucus or secretions.
9. Rinse tracheal mask after each _____.
10. Wash _____ before and _____ each treatment.

10

Introduction

This workbook includes~

- A basic discussion of the anatomy and function of the respiratory system
- Suctioning procedure
- Misting procedure

Part I

Anatomy and Function of the Respiratory System

OBJECTIVE

At the end of Part I, you will be able to identify and list the basic anatomy of the upper and lower respiratory system.

ANATOMY OF RESPIRATORY SYSTEM

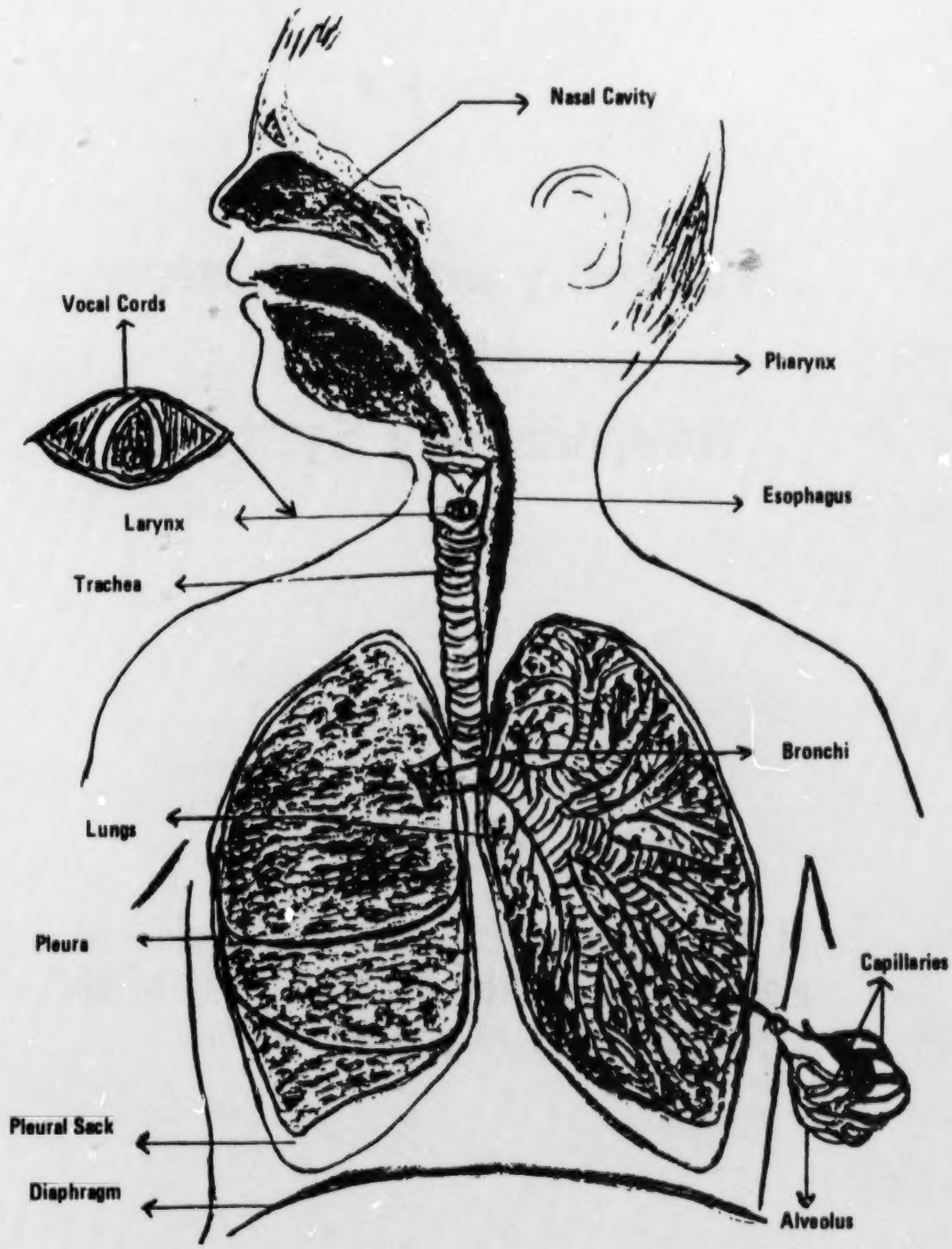


Figure 1

RESPIRATORY SYSTEM

In order to be able to effectively manage the needs of a student with a tracheostomy, a basic understanding of the anatomy and function of the respiratory system is necessary. The respiratory system consists of a number of passages for the inspiration and expiration of air and an organ for the absorption of oxygen and elimination of carbon dioxide. It includes the nasal cavity, oral cavity (pharynx), larynx, trachea, lungs, chest cavity, diaphragm (see Figure 1), and respiratory centers which are located in the medulla. The medulla is located at the base of the skull.

THE NOSE, or nasal cavity, is a deep cavity forming a projection in the midline of the face. It functions as an air conditioning system. At its entrance (nostrils or nose), long hairs filter the incoming air; and blood vessels in the passages provide heat.

The nasal cavity is lined with mucous membranes. The mucous membranes contain goblet cells which secrete a viscous fluid called mucus which provides moisture to the air. The nasal passages are moistened further by mucus draining from four hollows or sinuses in the bones of the face.

The mucous membrane of the nasal passages, as well as the trachea, also contain ciliated cells. These fine hair-like follicles beat against the flow of the air, further preventing any particles from entering the lungs. Deeper within the nose, the air passages take a horizontal direction and run beneath the floor of the cranium in the direction of the throat (pharynx).

THE PHARYNX, or throat, is divided into three parts: the upper-most part behind the nasal cavity (nasopharynx); the mid-portion behind the mouth (oropharynx); and the lowest segment (laryngopharynx). The throat branches out with two separate openings: one for the passage of food into the stomach (esophagus); the other for the passage of air into the lungs (windpipe or trachea).

THE ESOPHAGUS is a continuous passage from the pharynx (throat). It provides passage of food into the stomach. The opening for the windpipe (trachea) is directly in front of the esophagus and below the tongue, and allows air to flow into the lungs.

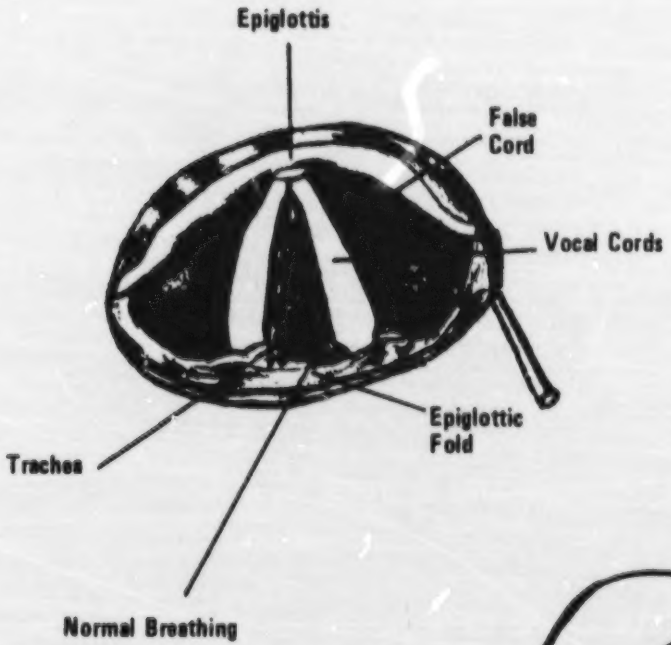
THE LARYNX, or organ of voice, is located above the trachea and lies in the midline of neck where it easily may be felt beneath the skin. The opening of the larynx is just behind the tongue (see Figure 2), and is called the glottis. A pear-shaped flap of cartilage is attached to the root of the tongue. This is called the epiglottis. During the process of swallowing food or drink, the epiglottis closes tightly over the glottis preventing entrance into the trachea and allowing food into the esophagus. If by chance some particle of food should enter the windpipe or trachea, the body's protective mechanism (the coughing reflex) comes to the rescue.

The larynx is a cylindrical structure which contains a pair of vocal cords or ligaments. These may be set in vibration by the air expired from the lungs. The larynx does not produce speech. The nasal passages, the mouth, and chest all act as a resonating chamber for sounds produced by the vocal cords.

THE TRACHEA is a tube beginning at the lower end of the larynx and passing into the thorax (chest). It terminates and divides into the left and right bronchi which are located in the lungs (see Figure 1). In its walls are a series of cartilaginous rings which keep its cavity open. This is in contrast to the esophagus which is flat.

The tracheal tube is lined with mucosa, cilia (a hair-like follicle), serous glands, and thin-walled blood vessels. The final process of filtration, humidification, and warming of the incoming air takes place here.

VOCAL CORDS VISUALIZED WITH A LARYNGEAL MIRROR



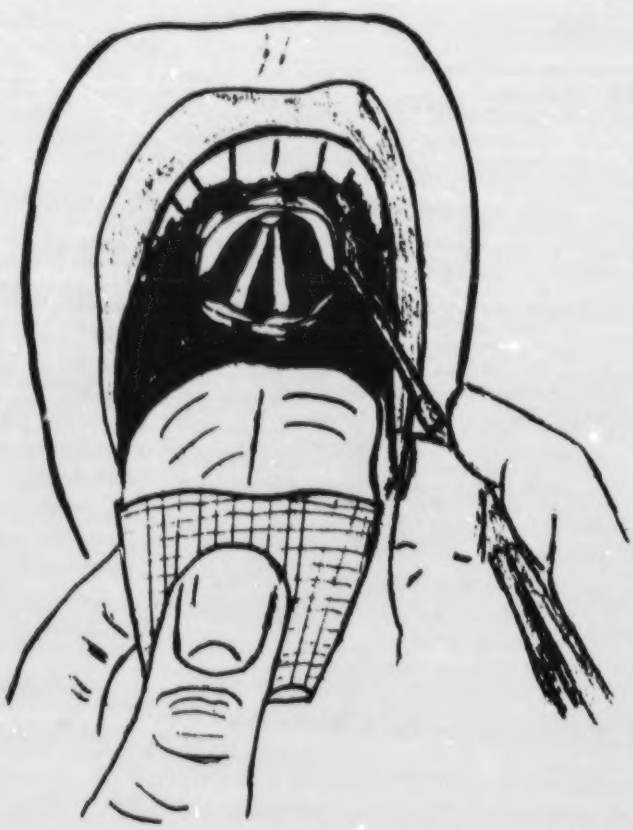


Figure 2

THE BRONCHI branch out at the end of the trachea and are located in the lungs. They are joined at the point of entry into the lungs by a pulmonary artery and two pulmonary veins. They are held together by connective tissues. The surface of the lungs is covered by a thin membrane known as the pleura. The lungs are spongy in texture, and are subdivided by deep fissures into lobes: two are in the left lung; three are in the right lung. They occupy most of the chest cavity.

The large bronchi branch out and subdivide into smaller ones, giving the appearance of a bronchial tree. The smaller ones are known as bronchioles; the terminal ones, respiratory bronchioles. The respiratory bronchioles give a number of branches, called alveolar ducts, from which arise single air cells or alveoli and alveolar sacs. It is here where the exchange of oxygen and carbon dioxide takes place.

THE CHEST CAVITY which is composed of the ribs, sternum, vertebrae, and muscles provides a protective covering for the lungs. The diaphragm is the muscle directly beneath the lungs. Both are part of the respiratory action.

BREATHING MECHANICS (see Figure 3)

The process of breathing is both voluntary and involuntary. Most of the time it is involuntary. The rate of respiration (breathing) is controlled by the respiratory centers in the brain. The level of carbon dioxide in the blood stream passing through the respiratory centers is the most important factor in regulating the depth and rate of respiration.

During inspiration (breathing in), the external intercostal muscles contract causing the ribs and sternum to move upward and outward. This causes the chest cavity to expand. The diaphragm contracts and drops down, further increasing the chest capacity. This allows the air to rush in and fill the lungs. During expiration (breathing out), the external intercostal muscles relax; and the ribs and sternum move downward and inward, decreasing the width of the chest. The diaphragm relaxes into its up position and the air is squeezed out of the lungs. This cycle normally takes place at the rate of 16 times per minute in an adult.

An example of voluntary breathing is when a person consciously takes a deep breath such as during an exercise program.

SUMMARY OF RESPIRATION PROCESS

Air enters through the nose and mouth. Some filtration takes place through the hair follicles and mucosa in the nasal cavity. The air passes through the larynx and on to the trachea. The mucosa in the trachea continues to moisten the air; the cilia or hair follicles and mucus trap dust towards the mouth; and the blood vessels warm the air. The air passes into the bronchi which branch out into both lungs. It then continues into the smaller branches and reaches the bronchioles, to the respiratory bronchioles through the alveolar ducts, to the alveolar sacs. There the exchange of oxygen and carbon dioxide takes place.

The oxygenation of lungs takes place during inspiration. The reverse process takes place during expiration, and the carbon dioxide is released into the air.

BREATHING MECHANICS

Exhaling

When we breathe out, the diaphragm rises and the ribs close in. This reduces the chest cavity. The lungs become compressed and air is expelled.

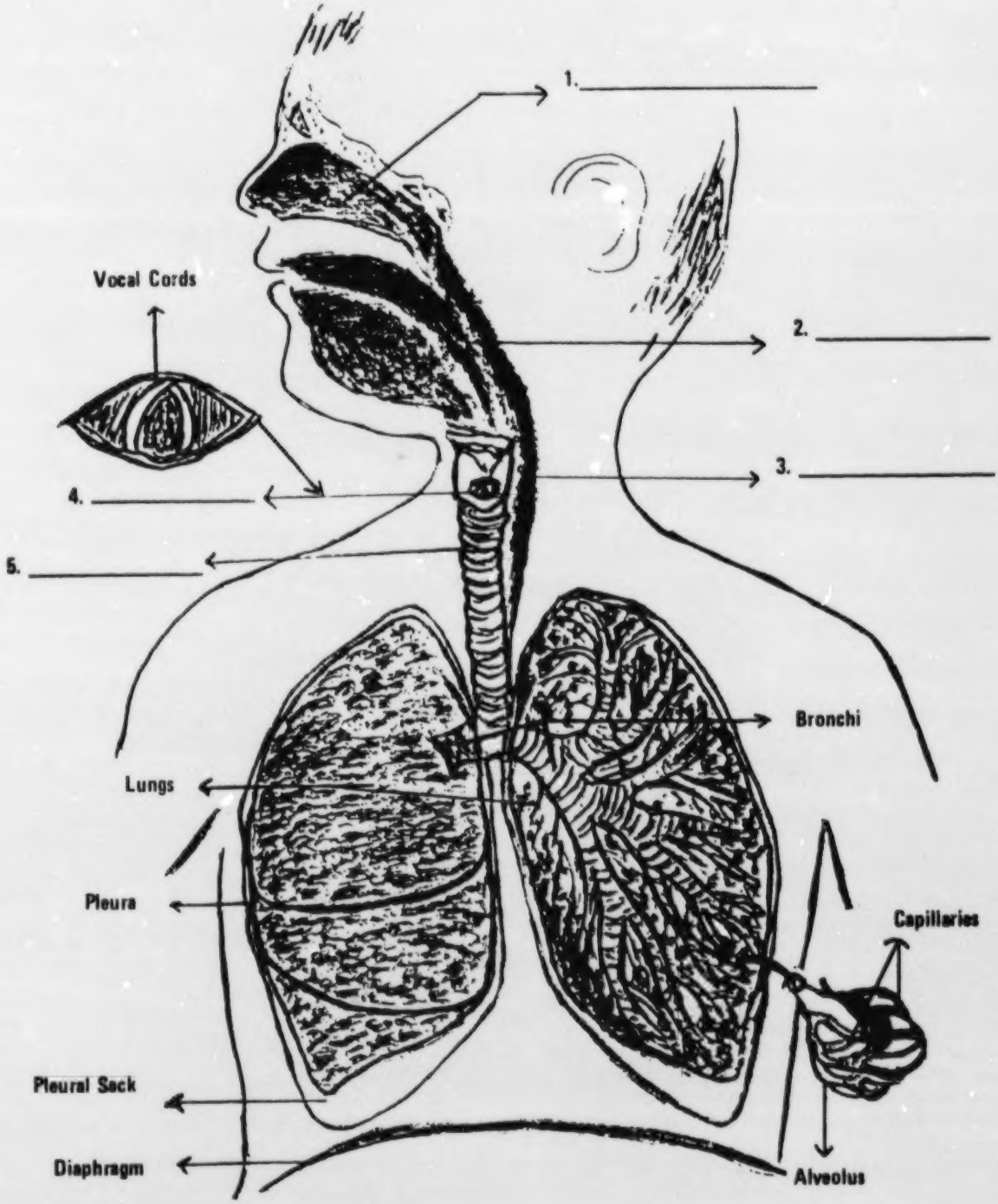
Inhaling

When we breathe in, the diaphragm expands downward and the ribs move out. The chest cavity increases in capacity and the lungs fill with air.

Figure 3

Identify parts of the upper and lower respiratory system by filling in the blanks on the diagram below. *(Correct answers appear on the following page.)*

ANATOMY OF RESPIRATORY SYSTEM



Parts Of Upper And Lower Respiratory System – Correct Answers:

1. Nasal Cavity
2. Pharynx
3. Esophagus
4. Larynx
5. Trachea

Part II

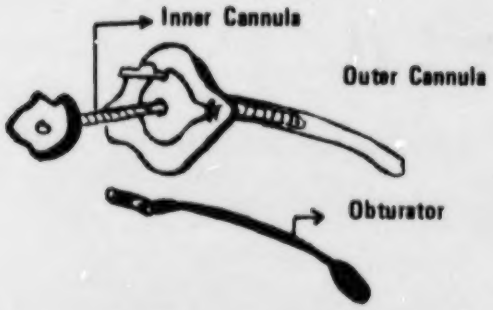
Suctioning Procedure

OBJECTIVE

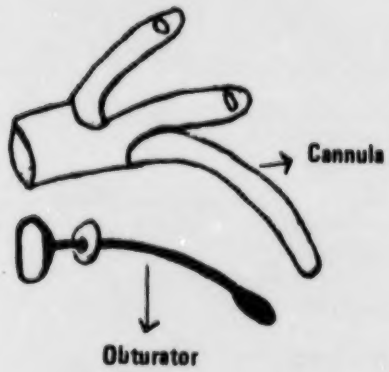
At the end of Part II, you will be able to list (in writing) the purposes of suctioning. You will give a return demonstration of the procedure for the school nurse health specialist.

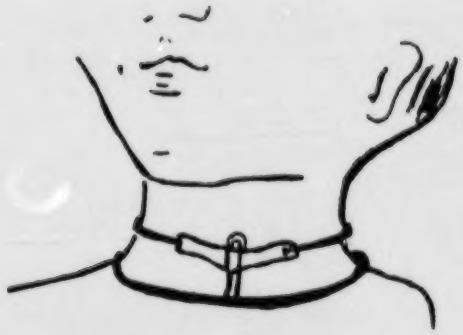
TYPES OF TRACHEOSTOMY TUBES

JACKSON TRACHEOSTOMY TUBE



SHILY TRACHEOSTOMY TUBE





STENT TRACHEOSTOMY TUBE

Figure 4

INTRODUCTION

There are a variety of causes which make it necessary to perform a tracheostomy:

- A malignancy such as cancer of the trachea;
- An anatomical anomaly such as a very narrow spot in the trachea which prevents free flow of air;
- Injury to trachea –
  - ✓ accident,
  - ✓ damage to trachea when an endotracheal tube is inserted;
- Inability to handle secretions;
- Recurrent aspiration pneumonia.

The treatment for any of the above is to surgically perform an opening below the throid cartilage (Adam's apple) and insert a tube to provide free access of air. (See Figure 4 for types of tracheostomy tubes.)

INDICATIONS FOR PROCEDURE

Suctioning of the student with a tracheostomy tube is necessary when an excessive amount of secretion accumulates and the child is not able to swallow or cough up. If these secretions remain, they may block the airway and lead to respiratory problems. The symptoms that can lead to respiratory problems are gagging, coughing, and the skin may turn blue.

STERILE TRACHEOSTOMY SUCTIONING PROCEDURE USING SLEEVED CATHETER (*Glove Procedure*)[3]

General Guidelines:

- A qualified person trained in suctioning must be on site whenever a student requiring suctioning is at school.
- The student's school program is arranged so that (s)he is within easy access to the suctioning equipment.
- Encourage student to cough to clear airway and possibly eliminate need for suctioning. However, some students may not be able to cough.
- Avoid unnecessary suctioning to reduce chances of injury and infection.
- Aseptic technique is to be used for suctioning.
- Suctioning shall be performed –
  - ✓ according to physician's special orders,
  - ✓ upon request of student,
  - ✓ when noisy, moist respirations occur,
  - ✓ when respiratory distress exists,
  - ✓ when mucus is visible at trachea opening.

[3] Ibid., p. 42.

Suctioning:

The purpose of suctioning is to maintain an open airway by keeping it clear of excessive secretions.

PLEASE NOTE – Before suctioning, check to see tracheal ties around neck are in place and secure.

ESSENTIAL STEPS		KEY POINTS AND PRECAUTIONS
PREPARATION OF STUDENT		
1. Explain procedure to student and how (s)he can assist.		Positioning is dependent upon student's condition and physician recommendation.
2. Position student with tracheostomy area exposed.		
EQUIPMENT (see Figures 5, 6, & 7) Assemble and prepare equipment in a clean area.		
Suction Machine	1. Connect machine to electric outlet.	
Sterile Packed Connection Tube	2. Attach tubing to top of collecting bottle.	
	3. Check seal of bottle for tight fit.	Cap and tubing must be airtight to establish a vacuum.
	4. Wash hands.	
	5. Open package.	
Packaged Sterile Sleeved Catheter	6. Assemble trough without touching the inside.	Maintain sterility.
Bottle Of Sterile Distilled Water	7. Pour Sterile Distilled Water into opened trough.	
	8. Attach catheter (valved end) to connection tube.	
PROCEDURE FOR SUCTIONING: (see Figures 8 & 9)		
	9. Touching ONLY the plastic sleeve, slip catheter out exposing only 4 inches.	
	10. Close vent with thumb and test suction by dipping catheter into distilled water. Check pressure to see it is between 5 – 10 Hg.*	This makes sure the system is working. Average Pressure Settings: *Infant* – 3-5" *Children* – 5-10" *Adult* – 7-15"
	11. With vent OPEN, insert catheter a maximum of 3 inches into trachea.	
	12. Some resistance may be felt as the catheter goes around the bend of the tracheal tube.	Oxygen is removed in suctioning process. Greater danger of infection and bronchial spasm when deep suctioning is done by inexperienced persons.
	13. Closing vent with opposite thumb, withdraw catheter while rotating it.	This protects mucous membrane from injury.
	14. Upon removal, flush catheter with distilled water.	Limit to 10 seconds.
	Allow time for coughing and resting.	
	Observe for ease of breathing.	
	If respirations are still noisy and mucus is still present in trachea, repeat steps 10 – 15. DO NOT REPEAT MORE THAN 3 TIMES. *(continued)*	Prolonged and repeated suctioning can cause tracheal and bronchial spasms and loss of oxygen.

* This is setting for Gomco Suction Machine. Please note that Laerdale Suction Machine is set at half speed for a child.

ESSENTIAL STEPS	KEY POINTS AND PRECAUTIONS
14. (*Cont.*) If coughing is productive, wipe secretions from tracheal opening.	
Replace catheter into plastic sleeve if you must set it down.	This will keep it clean, and it will be ready for reinsertion.
15. IF SUCTIONING HAS BEEN INEFFECTIVE, call School Nurse or Head Teacher to assist in evaluating need for ambulance. Leave equipment set up for use.	
16. At end of day, report to parent any unusual symptoms or problems in relation to suctioning.	Important that parent/guardian be aware of what is happening.
17. OBSERVATION OF CHILD: Check for unusual symptions: i.e., color changes or difficulty in breathing.	
POST-SUCTIONING CARE OF EQUIPMENT:	
18. Rinse tubing and drainage bottle with warm water and detergent (NOT soap!): rinse with warm water: then soak in a solution of ½ vinegar and water for 15 minutes, followed by a final cold water rinse.	Vinegar helps to retard bacterial growth, especially pseudomonas.
19. Replace and tighten bottle cap of distilled water.	
20. Discard all sterile, disposable equipment.	
21. Replace all sterile equipment that was used, and prepare machine for use again.	
RECORD APPROPRIATELY:	
22. Using the *Daily Log of Treatment* form,[4] record the date, time procedure was done, observations following the procedure, and contact with parent/guardian.	

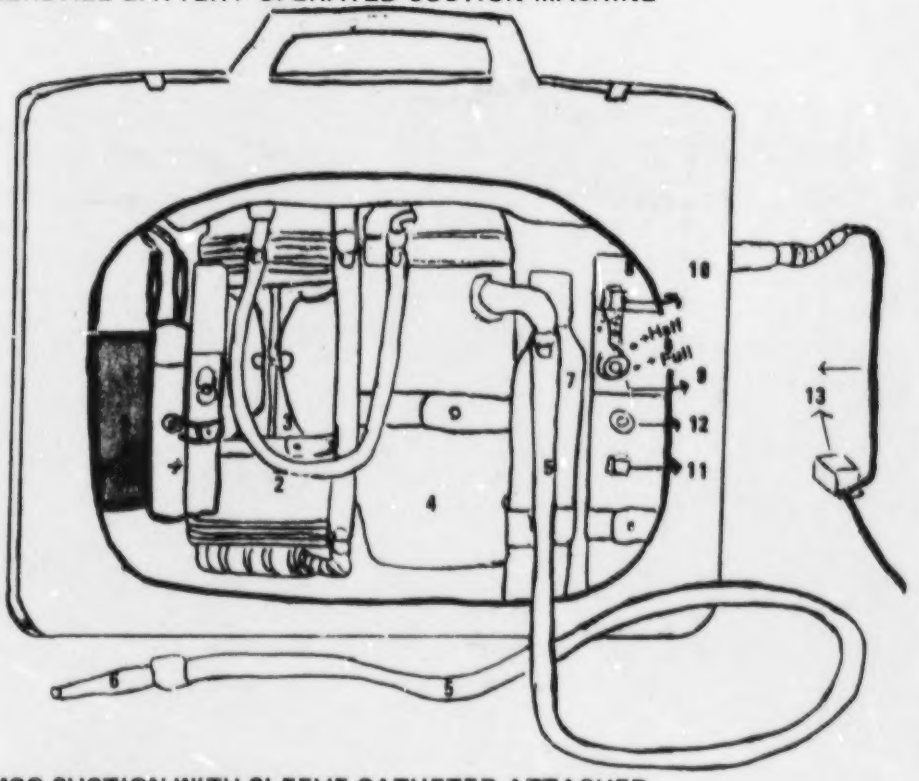
[4] Ibid., p. 5.

LAERDALE BATTERY OPERATED SUCTION MACHINE

Figure 5

KEY

1. Motor
2. Pump Cylinder
3. Piston
4. Vacuum Bottle
5. Suction Tube
6. Suction Tip
7. Water Container
8. Power Pack with Internal Batteries
9. Switch –*(half turn for children)*
10. Charging Indicator Lamp
11. On Voltage Indicator Lamp
12. Fuse Reset Button
13. Transformer Rectifier for Recharging



GOMCO SUCTION WITH SLEEVE CATHETER ATTACHED

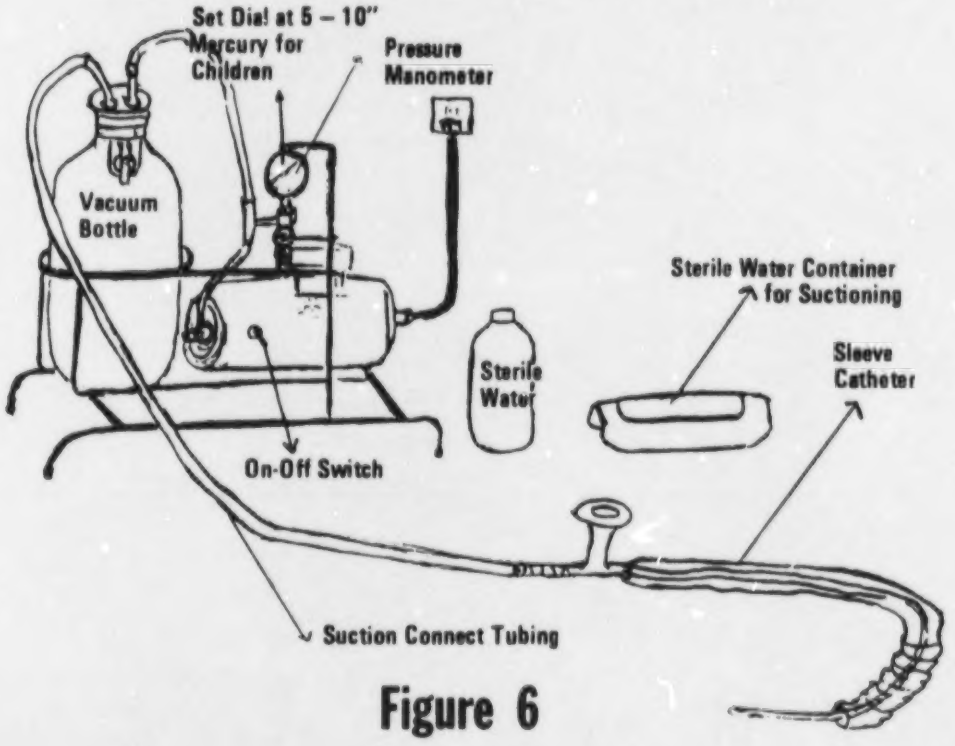
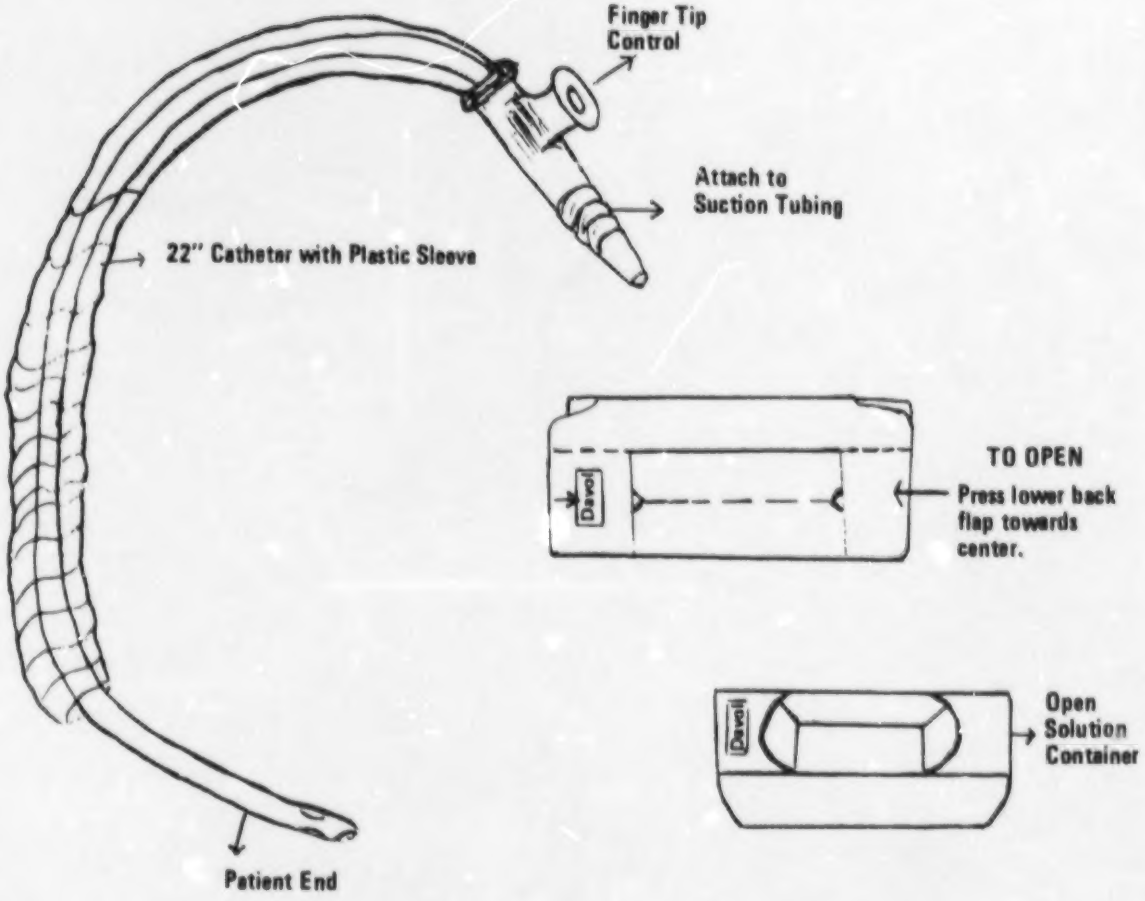


Figure 6

DISPOSABLE SUCTION CATHETER EQUIPMENT



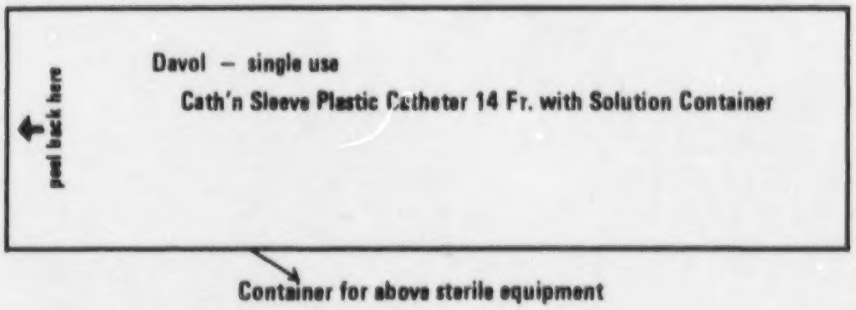
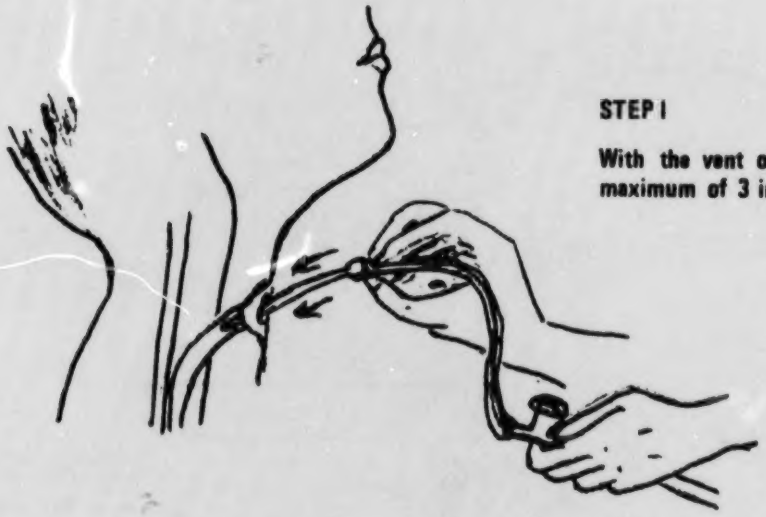

peel back here
Davol – single use
Cath'n Sleeve Plastic Catheter 14 Fr. with Solution Container
Container for above sterile equipment

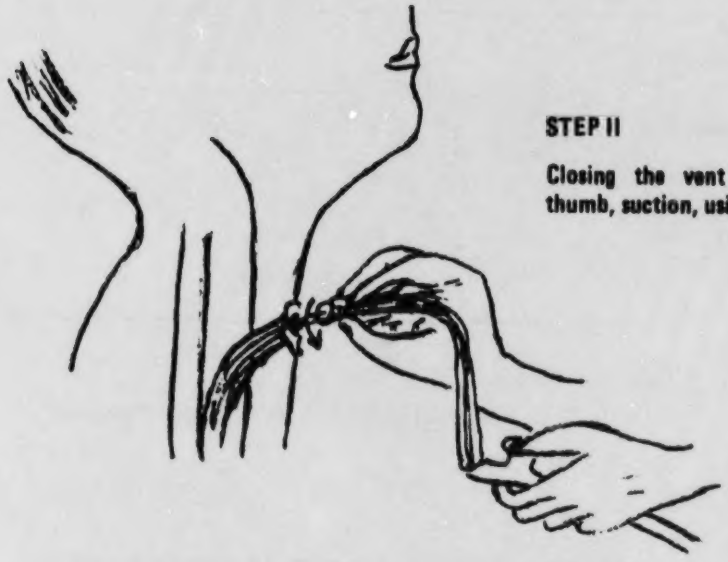
Figure 7

SUCTIONING PROCEDURE (Steps I & II)



STEP I

With the vent open, insert catheter a maximum of 3 inches into the trachea.

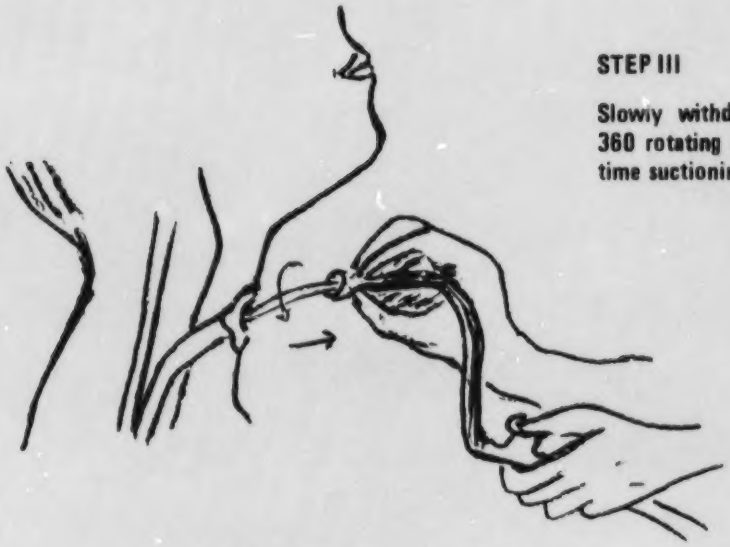


STEP II

Closing the vent with the opposite thumb, suction, using a rotating motion.

Figure 8

SUCTIONING PROCEDURE (Steps III & IV)



STEP III

Slowly withdraw the catheter using a 360 rotating motion while at the same time suctioning the passage way.

STEP IV

Upon removal, flush catheter with distilled water.

If respirations are still noisy and mucus is present in trachea, repeat above steps.

DO NOT REPEAT MORE THAN 3 TIMES.

Figure 9

Fill in the blanks below. (*Correct answers appear on the following page.*)

Suctioning shall be performed:

1. According to physician's orders;
2. Upon request of the child;
3. When _____ , _____ respirations occur;
4. When respiratory _____ exists;
5. When _____ is visible at the _____opening.

Correct Answers To Questions On Preceding Page:

3. noisy, moist
4. distress
5. mucus . . . . trachea

Part III

Misting Procedure

OBJECTIVE

At the end of Part III, you will be able to list (in writing) the purpose of mist application and give a return demonstration to the school nurse health specialist.

EXAMPLE OF SIMPLIFIED LOW MAINTENANCE MIST MACHINE

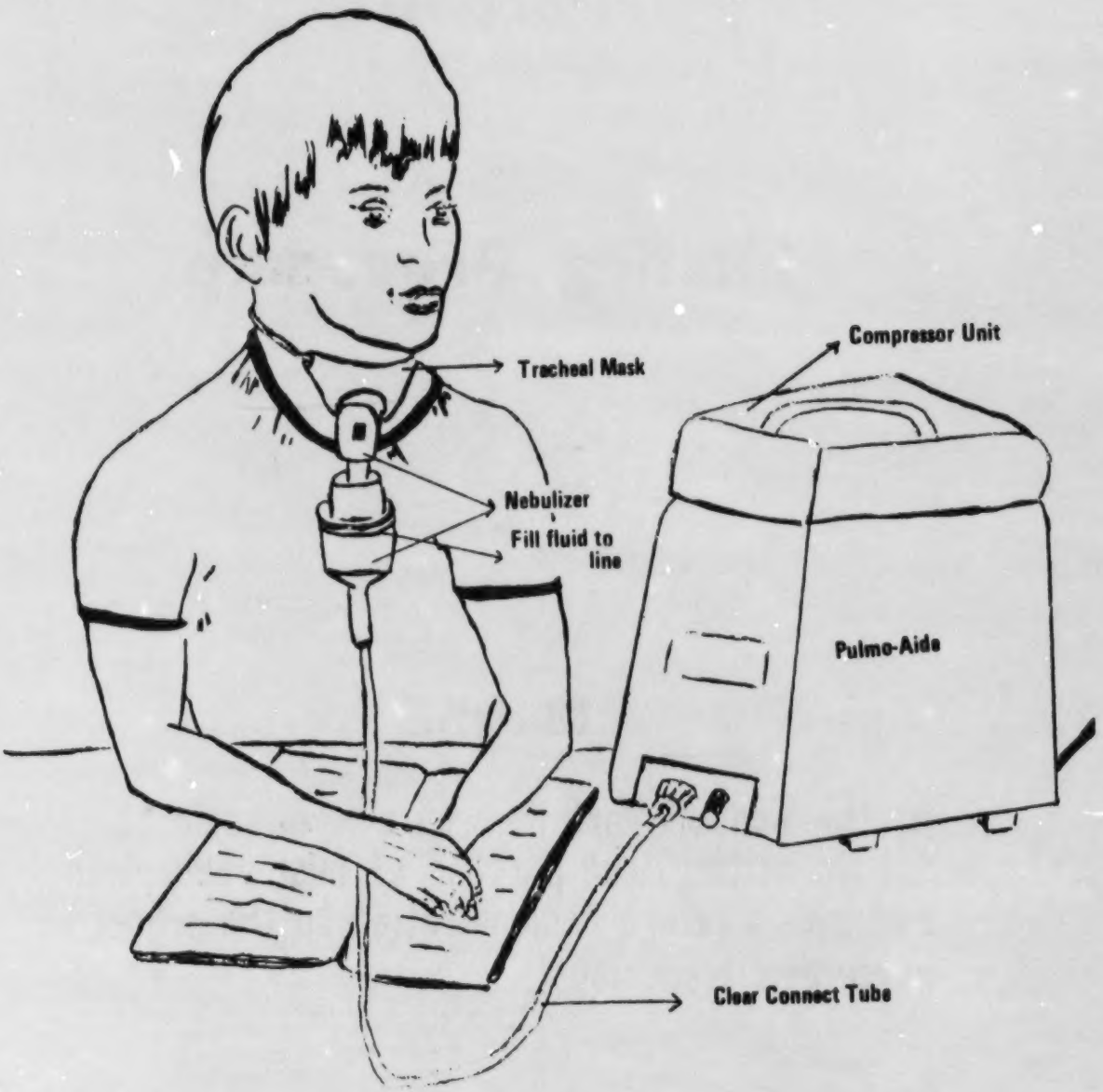


Figure 10

MIST MACHINE PROCEDURE FOR TRACHEOSTOMY

General Guidelines:

- The student's program should be arranged so that the machine is within easy access.
- Mist should be applied –
  - ✓ at designated times set by physician;
  - ✓ when breathing is harsh and raspy, indicating dry lung linings;
  - ✓ more frequently when low humidity conditions exist, particularly during the cold weather when the heater is running all day (a heater tends to make a room very dry) and during very hot weather.

Equipment:

- Mistogen Machine (i.e., Pulmo-Aide)
- Sterile water or normal saline
- Vinegar solution and dish detergent for cleaning
- Tracheostomy mask
- Nebulizer
- Clean Connecting Tube

Personnel Recommendation:

Nurse, student and qualified designated personnel

ESSENTIAL STEPS	KEY POINTS AND PRECAUTIONS
1. Select a comfortable area in your classroom where the unit can be placed and treatment can be taken.	Educational program can continue during the process.
2. Plug in the compressor unit.	
3. Fill the nebulizer with prescribed amount of solution (sterile water or 0.9% saline). The nebulizer is filled through the main orifice. Fill to designated line. Do not overfill. Attach to clear connecting tubing and to tracheal mask.	If possible, student should become self-sufficient in performing procedure.
4. Attach the clear connect tubing to the air compressor. Turn compressor on.	
5. Mist student for at least twenty minutes.	
6. Turn off the unit when you finish.	
7. Encourage coughing a few times to loosen and bring up mucus or secretions.	
8. Rinse tracheal mask after each treatment.	Steps 8 and 9 promote student action and responsibility.
9. Wash hands before and after each treatment.	
10. Nebulizer and tracheal mask is sent home at end of day to be cleaned by parent and then returned to school.	Promotes parent responsibility.
11. Clean equipment (see section on *Cleaning Equipment*).	

Cleaning Equipment (adapted from *Livingston Home Care*)

Supplies needed:

- Liquid detergent (such as Joy)
- White vinegar
- Scrub brushes (bottle brush, long bristle scrub brush)
- Two basins or buckets (one with cover)
  - ✓ Basin one should contain detergent water (discard after each use);
  - ✓ Basin two should be one part white vinegar to one water.

After every treatment:

1. Rinse nebulizer cup and tracheal mask in warm water, shake dry, and reassemble.
2. Store in clean, dry paper bag.

Once a day:

1. Disassemble equipment and nebulizer. Wash in warm soapy water (Basin 1). Equipment should be scrubbed thoroughly, cleaning off all foreign matter. Let soak for approximately 15 minutes.
2. Rinse thoroughly under warm water. Shake off excess moisture.
3. Soak equipment in vinegar solution (Basin 2) for a minimum of 20 minutes. Be sure hollow parts are filled with solution. Carefully rinse all parts after soaking. Be careful not to touch the sink with the equipment. Shake off excess moisture, and let air dry on clean towel. Do not wipe or dry with towel.
4. Reassemble equipment when it is dry; store, ready for use, in a dry paper bag.

Fill in the blanks below. (*Correct answers appear on the following page.*)

Mist should be applied:

1. At _____ times set by the physician or nurse;
2. When breathing is _____ or _____ indicating dry lung linings;
3. More frequently when _____ _____ conditions exist; particularly during cold weather when the heater is running all day and during very _____ weather.

Correct Answers To Questions On Preceding Page:

1. designated
2. harsh . . raspy
3. low humidity . . . . . hot

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You have completed the material in this workbook. Take the Post Test. When you are finished, the School Nurse will demonstrate the suctioning and misting procedures. You will be expected to do a return demonstration. The School Nurse Health Specialist also will review monthly this procedure with you as required by State law.

TRACHEOSTOMY SUCTIONING AND MISTING POST TEST

1. Suctioning shall be performed
   a. When _____
   b. When _____
   c. When _____
   d. According to M.D.'s special orders
   e. Upon request of the child.
2. Equipment needed for the procedure includes:
   a. Suction machine
   b. _____
   c. Container of sterile fluid.
3. The basic steps included in the tracheostomy suctioning procedure are:
   a. Open and attach _____ to suction machine tubing.
   b. Turn machine on.
   c. Push _____ sleeve away from catheter (about 6 inches).
   d. Test suction by inserting tube into sterile _____ and observe the flow of sterile _____ through the catheter and tubing.
   e. Insert the catheter _____ without closing the control valve.
   f. Rotate the catheter and withdraw quickly with control valve _____ . Do not suction more than 10 seconds.
   g. Rinse tube as necessary.
   h. Observe student closely after the procedure for improved color and _____.
   i. Repeat the procedure as many as _____ times. If color and respiration do not improve, seek other assistive care.
   j. Rinse tubing and drainage bottle in clear water, then wash in warm detergent water and rinse in vinegar solution made up of _____ part boiled water and _____ part white vinegar.
4. The three parts of the throat are:
   a. _____
   b. _____
   c. _____

(continued on reverse)

5. Misting should be applied
   a. At _____ time set by physician or nurse.
   b. When breathing is _____ and _____ indicating dry lungs.
   c. Frequently when _____ + humidity exists and during very _____ weather.
6. Sterile _____ or 0.9N _____ solution is used for misting.
7. Mist student for at least _____ minutes.
8. Encourage _____ to loosen and bring up any mucus or secretions.
9. Rinse tracheal mask after each _____.
10. Wash _____ before and _____ each treatment.

Correct Answers To Post Test Questions:

1. a. noisy, moist respirations occur
   b. respiratory distress exists
   c. mucus is visible at trachea opening – that cannot be coughed out
2. b. Sterile sleeved catheter
3. a. sterile catheter
   c. sterile (catheter)
   d. fluid . . . . . fluid
   e. until it meets resistance or according to M.D.'s orders
   f. closed
   h. respiration
   i. three
   j. one-half . . . . . one-half
4. a. larynx
   b. esophagus
   c. trachea
5. a. designated
   b. harsh . . . raspy
   c. low . . . . hot
6. H_2O . . . . saline
7. 20
8. coughing
9. treatment
10. hands . . . after